

REMARKS

Claims 1-8 and 10-17 were pending in the present application and rejected. Claims 1, 4, and 8 are amended. Thus, upon entry of this amendment claims 1-8 and 10-17 are pending.

No new matter is added. The rejections are respectfully traversed in light of the following remarks, and reconsideration is requested.

Rejections under 35 U.S.C. § 103

Claims 1-8, 12, and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Pub. 20020057247 to Lee et al. (hereinafter "Lee") in view of U.S. Patent 6,753,855 to Yu (hereinafter "Yu") and further in view of U.S. Patent 6,091,164 to Buell (hereinafter "Buell"). Claims 10, 11, and 14-17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view of Yu and further in view of Buell and U.S. Patent Pub. 20020130830 to Park (hereinafter "Park").

Claims 1, 4, and 8 are amended, support for which can be found in the specification, for example, at paragraphs 49-53 of the pre-grant Publication No. 20040207620 (or paragraphs 47-51 of the specification as filed) and Figure 5. Applicant respectfully submits that no new matter is added.

Lee

Lee at paragraphs 105-107 discloses that the BIAS CONTROL voltage of an LCD is pulsed during a start-up period (e.g., 1 second, see left half of Figure 4) to provide to the LCD display 600 alternating pulses of a bias voltage and the Vcom voltage (see Figure 5; see also, e.g., Figure 6, where BIAS is used to control switch 520 to alternate Bias Voltage with Vcom to provide the alternating pulses of bias voltage and Vcom to LCD panel 600). The bias voltage-Vcom pulses are provided to the LCD display 600 to transition the LCD more quickly

from a Homogeneous (H) liquid crystal state to a Bend (B) liquid crystal state (see Figures 1 and 2).

Thus, the BIAS CONTROL pulsing (Fig. 4) provides pulses (Fig. 5) of an external bias voltage alternated with Vcom to display 600 (Fig. 3, Fig. 6) not to backlight 800 (although Figures 3 and 6 show a line passing through backlight 800, it is clear from paragraphs 104-107 that the pulses of bias voltage alternated with Vcom – shown in Fig. 5, not the BIAS control shown in Fig. 4 – are applied to the display 600). The bias voltage-Vcom pulses are applied to transition the liquid crystal in the LCD 600 more quickly from Homogeneous to Bend state during a period (e.g. 1 second startup period) when the backlight is off. Paragraph 107 states that operation of the backlight is interrupted until “transition into bend state has completed, the backlight control signal is applied.”

Thus, Lee teaches neither synchronous nor asynchronous operation of the lamp (inverter of claim 1) in the sense of synchronizing the lamp (inverter) with timing signals from the timing controller 100. Lee at most turns the lamp off (controlling driving voltage to the lamp with B/L CONTROL)while performing a special pulsing operation on the liquid crystal (not the lamp/inverter) with a bias voltage (controlling the bias voltage-Vcom pulses to the liquid crystal with the BIAS CONTROL voltage). Such operation is contrary to that of the power supply of Applicant’s claim 1, in which “the inverter is operated at a frequency that is synchronized with a frequency of the timing signal during the synchronous mode and is not synchronized with the frequency of the timing signal during the asynchronous mode.”

Moreover, it is seen from Figure 4 that once the startup period is over, both B/L CONTROL and BIAS CONTROL signals are maintained in a constant state, and neither signal is modulated, either in synchronization with or not in synchronization with the Vsynch or Hsynch signals – also shown in Figure 4 – from timing controller 100. (In this period after startup, BIAS CONTROL maintains a steady application of the Vcom voltage to the display

600 and B/L CONTROL maintains the inverter/lamp in an on state. The two signals have distinct purposes: BIAS CONTROL is never used to control the lamp/inverter.) Thus, it is evident that operation of Lee's invention is contrary to principles of operation – i.e., “inverter is operated at a frequency that is synchronized with a frequency of the timing signal” – of Applicant's power supply according to claim 1, and, therefore, it would be improper use of hindsight to combine Lee with any other reference to try to arrive at Applicant's power supply of claim 1.

Applicant therefore respectfully submits that any rejections to claim 1 based on Lee should be withdrawn. Claims 4 and 8 (as amended) having limitations similar to those of claim 1, Applicant also respectfully submits that any rejections to claims 4 and 8 based on Lee should be withdrawn.

Yu

Yu discloses that “the driving unit 10 receives a work period T, which is a work period of a CCFL [cold cathode fluorescent lamp]” (Yu, col. 2, lines 14-15), but does not give further information or suggestion what determines the “work period” T (Yu, col. 1, lines 25-30 and 45-50). Thus, Yu does not suggest Applicant's “inverter is operated at a frequency that is synchronized with a frequency of the timing signal.”

Indeed, Yu discloses dividing the work period T into a plurality (a plurality of two in the example described by Yu) of non-overlapping sub-periods T1 and T2 which alternate with each other during the work period to supply different (i.e., multiple) sets of CCFLs (Yu, col. 2, lines 50-54). Although Yu employs a term “asynchronous driving” (Yu, col. 2, lines 55-65) it is evident from the description at column 2, lines 55-65 and Figure 3, that Yu uses the term in the sense that the sub-periods begin at different times in order to alternate with each other. So the sub-periods T1 and T2 are not “synchronized” with each other, yet it is evident

that the sub-periods T1 and T2 are synchronized with the work period T in that T1 and T2 divide up T into alternating sub-periods – as illustrated by Figure 3 and by col. 1, lines 47-49, which state: “The invention thus achieves a goal of driving the LCDM [liquid crystal display module] using different timings within a work period.” Thus, Applicant submits that Yu uses “asynchronous” only in the sense of “alternating” and not, as in Applicant’s claim 1, in the sense of “not synchronized with the frequency of the timing signal during the asynchronous mode.”

Thus, Yu teaches dividing up a work period (in synchronization with the work period) that is a duty cycle for multiple sets of lamps to distribute power to multiple sets of lamps, but does not teach an “inverter is operated at a frequency that is synchronized with a frequency of the timing signal during the synchronous mode and is not synchronized with the frequency of the timing signal during the asynchronous mode” as in Applicant’s claim 1.

Therefore, assuming that it would not be improper to combine Lee with any other reference, Yu would not cure the deficiencies of Lee nor would Lee cure the deficiencies of Yu. Applicant therefore respectfully submits that any rejections to claim 1 based on Yu should be withdrawn. Claims 4 and 8 (as amended) having limitations similar to those of claim 1, Applicant also respectfully submits that any rejections to claims 4 and 8 based on Yu should be withdrawn.

Buell

Buell discloses a transistor 21 that operates in conjunction with an inductor 22 to supply a high voltage to a lamp (Buell, col. 2, lines 55-65). Buell discloses a second transistor 52 that operates in conjunction with an inductor 51 that may optionally be added as a “boost” circuit 12 in parallel to the circuit of transistor 21-inductor 22 to “increase the voltage on EL lamp 27” (Buell, col. 3, lines 35-45). Buell discloses at col. 3, lines 45-57 (cited by the Office

action) that “transistors 21 and 52 operate in synchronism but need not” and “diodes 24 and 53, and diodes 25 and 54, act as OR gates for the pulses from inductors 22 and 51, enabling asynchronous operation if desired.[emphasis added]” Thus, the synchronism and asynchronous operation of Buell refers only to whether the optional boost circuit 12 and transistor 21-inductor 22 operate in synchronization with each other, both being synchronized in some manner to local oscillator 41 included in the inverter (col. 3, lines 24-36).

Thus, Buell teaches only an internal synchronization of parts of an inverter, contrary to Applicant’s claim 1, which calls for “a timing signal received from the outside” and an “inverter is operated at a frequency that is synchronized with a frequency of the timing signal.”

Therefore, in so far as each of Buell, Yu, and Lee contain teachings contrary to Applicant’s claim 1, Applicant respectfully submits that any combination of Buell, Yu, and Lee must teach away from Applicant’s claim 1 and that any rejections to claim 1 based on Buell, Yu, or Lee should be withdrawn. Claims 4 and 8 (as amended) having limitations similar to those of claim 1, Applicant also respectfully submits that any rejections to claims 4 and 8 should be withdrawn for the same reasons.

Park

Dependent claims 10, 11, and 14-17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view of Yu and further in view of Buell and Park.

Park is cited by the Office action as disclosing, for example, “a driving method of moving picture and still image mode”; outputting different levels of control signal according to whether the display mode is moving-image mode or still-image mode; and outputting or not outputting a timing signal according to the level of control signal. Although Park may disclose “checking the image signals, and when the image signals are found to be moving

pictures, outputting a high or a low voltage to the inverter according to whether the image signals require high or low luminance level” (paragraph 10), Park makes no suggestion in regard to an “inverter is operated at a frequency that is synchronized with a frequency of the timing signal” as in Applicant’s claim 1. Thus, Park does not cure the deficiencies of Lee, Yu, and Buell in such regard, and Applicant therefore respectfully submits that claims 1, 4, and 8 as amended are patentable over any combination of Lee, Yu, Buell, and Park.

The remaining claims, being dependent on claims 1, 4, and 8, Applicant respectfully submits are patentable over any combination of Lee, Yu, Buell, and Park for at least the same reasons.

Accordingly, for all of the above reasons, Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. § 103.

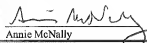
CONCLUSION

For the foregoing reasons, Applicant believes pending claims 1-8 and 10-17 are allowable, and a Notice of Allowance is respectfully requested. If the Examiner has any questions regarding the application, the Examiner is invited to call the undersigned Agent at (949) 752-7040.

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